LISTING OF THE CLAIMS

The following listing of claims is included for convenience only. No new amendments are included in the claims.

1. (Previously presented) A method of managing radiation, the method comprising:

providing a semiconducting device having a two-dimensional carrier gas, wherein the semiconducting device comprises at least one of: a heterodimensional diode, a field effect transistor array, a heterodimensional diode array, or an array of rectifying contacts;

exciting the carrier gas by generating a laser pulse with a laser and shining the laser pulse directly onto the semiconducting device, wherein the laser pulse has a duration of approximately one femtosecond to ten picoseconds; and

adjusting a frequency of the radiation to a desired frequency using a voltage applied to the semiconducting device.

2. (Previously presented) The method of claim 1, wherein the radiation comprises at least one of: terahertz radiation or microwave radiation.

3. (Previously presented) The method of claim 1, wherein the adjusting adjusts at least one of: a gate bias voltage or a drain bias voltage.

Claims 4-6 (Canceled)

7. (Previously presented) The method of claim 1, wherein the exciting includes shining the laser pulse onto at least one of: a top side or a bottom side of the semiconducting device.

8. (Previously presented) A method of generating radiation using a field effect transistor, the method comprising:

generating a laser pulse with a laser and shining the laser pulse directly onto at least one of: a gate-source spacing, a gate, a gate-drain spacing, or a substrate of the field effect transistor; and

adjusting a frequency of the radiation to a desired frequency by adjusting a carrier density of carriers in a channel of the field effect transistor, wherein the adjusting includes adjusting a gate length for the gate.

9. (Canceled)

10. (Previously presented) A method of generating radiation using a field effect transistor, the method comprising:

generating a laser pulse with a laser and shining the laser pulse directly onto the field effect transistor; and

adjusting a frequency of the radiation to a desired frequency by adjusting a carrier density of carriers in a channel of the field effect transistor, wherein the field effect transistor comprises a transparent gate, and wherein the laser pulse is shone onto the transparent gate.

11. (Previously presented) A method of generating radiation using a field effect transistor, the method comprising:

generating a laser pulse with a laser and shining the laser pulse directly onto the field effect transistor; and

adjusting a frequency of the radiation to a desired frequency by adjusting a carrier density of carriers in a channel of the field effect transistor, wherein the adjusting uses a bias voltage applied to a periodic grating gate of the field effect transistor.

12. (Canceled)

13. (Previously presented) A method of generating radiation using a field effect transistor, the method comprising:

generating a laser pulse with a laser and shining the laser pulse directly onto at least one of: a gate-source spacing, a gate, a gate-drain spacing, or a substrate of the field effect transistor; and

adjusting a frequency of the radiation to a desired frequency by adjusting a carrier density of carriers in a channel of the field effect transistor, wherein the radiation comprises at least one of: terahertz radiation or microwave radiation.

14. (Previously presented) A method of generating radiation using a field effect transistor, the method comprising:

generating a laser pulse with a laser and shining the laser pulse directly onto at least one of: a gate-source spacing, a gate, a gate-drain spacing, or a substrate of the field effect transistor; and

adjusting a frequency of the radiation to a desired frequency by adjusting a carrier density of carriers in a channel of the field effect transistor, wherein the laser pulse has a duration of approximately one femtosecond to ten picoseconds.

15. (Previously presented) A method of generating radiation using a heterodimensional diode, the method comprising:

generating a laser pulse with a laser and shining the laser pulse directly onto at least one of a top side or a bottom side of the heterodimensional diode; and

adjusting a frequency of the radiation to a desired frequency using a voltage applied to the heterodimensional diode to adjust a frequency of a plasma wave in a two-dimensional carrier gas in the heterodimensional diode.

16. (Original) The method of claim 15, further comprising adjusting the frequency of the radiation by using a plurality of heterodimensional diodes.

17. (Previously presented) The method of claim 15, wherein the shining shines the laser pulse onto at least one of: a gate, an active layer, or a barrier layer of the heterodimensional diode, the method further comprising generating a second laser pulse with a second laser and shining the second laser pulse directly onto a substrate of the heterodimensional diode.

Claims 18-19 (Canceled)

20. (Original) The method of claim 15, wherein the heterodimensional diode includes at least one ohmic contact and at least one rectifying contact.

21. (Previously presented) A method of managing radiation, the method comprising:

providing a field effect transistor having a two-dimensional carrier gas and a periodic grating gate;

exciting the carrier gas by generating a laser pulse having a duration of approximately one femtosecond to ten picoseconds with a laser, and shining the laser pulse directly on the field effect transistor; and

adjusting a frequency of the radiation to a desired frequency using a voltage applied to the field effect transistor.

22. (Canceled)

23. (Previously presented) A method of managing radiation, the method comprising:

providing a semiconducting device having a two-dimensional carrier gas, wherein the semiconducting device comprises at least one of: a heterodimensional diode, a field effect transistor array, a heterodimensional diode array, or an array of rectifying contacts;

exciting the carrier gas by shining a laser pulse having a duration of approximately twenty femtoseconds onto the semiconducting device; and

adjusting a frequency of the radiation to a desired frequency using a voltage applied to the semiconducting device.

24. (Previously presented) The method of claim 1, wherein a photon energy of the laser pulse exceeds 1.42 electron Volts.

25. (Previously presented) The method of claim 15, wherein the laser pulse has a duration of approximately one femtosecond to ten picoseconds.

26. (Previously presented) The method of claim 15, wherein the radiation comprises at least one of: terahertz radiation or microwave radiation.

27. (Canceled)

28. (Previously presented) A method of managing radiation, the method comprising:

providing a field effect transistor having a two-dimensional carrier gas and a periodic grating gate;

exciting the carrier gas by generating a laser pulse having a duration of approximately one femtosecond to ten picoseconds with a laser, and shining the laser pulse directly on the field effect transistor; and

adjusting a frequency of the radiation to a desired frequency using a voltage applied to the field effect transistor, wherein the radiation comprises at least one of: terahertz radiation or microwave radiation.

29. (Previously presented) The method of claim 14, wherein the shining excites plasma oscillations and wherein an active layer in the field effect transistor traps the plasma oscillations as plasma waves.